BRIEFER ARTICLES

REGENERATION OF BRYOPHYLLUM CALYCINUM

(WITH TWO FIGURES)

In two articles on regeneration of *Bryophyllum*, LOEB[1] bases his theories of inhibition and correlation in the regeneration of *Bryophyllum* upon the results of numerous experiments with severed leaves and portions of stems, and upon the negative results obtained with "normal plants." After reading these articles, the writer recalled numerous instances of regeneration seemingly at variance with the experiments described.

Experiments by LOEB indicate that under suitable conditions whole leaves severed from the plant produce shoots from only a few notches. The writer has found the number of notches which produce shoots to vary from one or two to all of the notches, when whole leaves were placed in the moist air of a Wardian case, or, more frequently, on damp soil in the garden. The growth of all or many notches of whole leaves does not coincide with LOEB's results, and furthermore is in direct opposition to his theory of the flow of certain substances in the leaf determined by the first notches which begin to grow, and the consequent inhibitory effect produced upon the growth of other notches. In view of LOEB's results and theories, more striking even than the growth of many notches on severed leaves is the production of roots and shoots in the notches of leaves attached to growing plants. In introducing his subject, LOEB asks, "Why does a leaf not form roots and shoots in its notches so long as it is in connection with a healthy plant?" (*loc. cit.* **60**:250). And again, under theoretical remarks, "When a plant is normal, it is almost or possibly absolutely impossible to induce the notches of a leaf which is connected with the plant to grow" (*loc. cit.* **60**:274).

Pot-grown plants of *B. calycinum* in the writer's possession have frequently grown both shoots and roots from leaf notches while the leaves were in connection with the plant. Early in the spring of 1917 a large plant of *Bryophyllum* (fig. 1) began to produce shoots from the leaves

[1] LOEB, JACQUES, Rules and mechanism of inhibition and correlation in the regeneration of *Bryophyllum calycinum*. BOT. GAZ. **60**:249–276. 1915; Further experiments on correlation of growth in *Bryophyllumca lycinum*. BOT. GAZ. **62**:293–302. 1916.

more abundantly than the plants often do. The accompanying photographs were taken May 12, when shoot production had reached its maximum. It was not necessary to induce the notches to grow; they grew freely under ordinary room conditions, and with only the usual attention which a pot plant in a residence receives.

A number of the leaves of the plant (fig. 2) produced shoots from all the notches or from all except the basal notches, a phenomenon which, to accord with LOEB'S theories, should take place only under very special conditions. The plant appears to be a "healthy plant," as healthy and

FIG. 1

FIG. 2

FIGS. 1 AND 2.—Fig. 1, large pot-grown plant of *Bryophyllum calycinum* producing shoots from many of its leaves; fig. 2, leaf of plant shown in fig. 1, with shoots growing from all except the two small basal notches.

vigorous a plant as the writer has ever seen. Whether or not it is a "normal plant," as a normal plant is conceived of by LOEB, is difficult to say, for nowhere does he define a "normal plant." He does state: "If, however, the flow of substances in a plant is abnormal, either because the roots or the apical parts or both have suffered, a growth of shoots may occur in moist air from the notches of leaves which are in contact with the plant." There is no indication that either the roots or the apical parts have suffered; the plant appears healthy, and has had no accident.

A "normal plant" will probably be interpreted to be a "healthy plant," inasmuch as these two terms are used interchangeably in con-

nection with statements concerning the growth of notches of leaves attached to plants. It would seem, therefore, that the conclusions reached by LOEB are not substantiated by the behavior of the plants in question.—E. LUCY BRAUN, *University of Cincinnati.*

MISTLETOE VS. MISTLETOE

(WITH ONE FIGURE)

The specimen shown in fig. 1 was collected near Tucson about three years ago by Professor J. J. THORNBER of this University. *Phoradendron flavescens*, the larger plant, acting both as partial parasite and host, is found on species of *Quercus*, *Fraxinus*, and *Juglans;* while *P. californicum*, the smaller one, is a common parasite on *Parkinsonia*, *Prosopis*, and *Acacia*. Although the mistletoe is of common occurrence on palo verde and mesquite in this region, the writer has never before seen one species parasitic on another. It is interesting to consider water and salts, and possibly other materials, as having to pass successively through the vascular systems of three different plants before they reach the cells wherein they enter into metabolic activities. With transpiration much stronger in *P. flavescens* because of its larger transpiring surface, it would appear as if the second species must have a rather difficult time in securing a sustaining share of the ascending stream of sap. Possibly physiologists could find a higher osmotic pressure in the smaller species to account for its ability to maintain an existence in its peculiar location.—J. G. BROWN, *University of Arizona.*

FIG. 1.—*Phoradendron californicum* parasitic on *P. flavescens*.